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DEVELOPMENT OF NEURAL CONVOLUTIONAL NETWORKS IN THE WORLD AND CHILD FEATURES

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This article discusses the main directions of development of machine learning and neural networks of intelligence, the rules of teaching children of preschool and school age when working with computers and the features of the graphical application interface for children.

Very often today you can hear the phrase "artificial intelligence" in everyday life. Machine learning is a very promising area in the development of computer science - this is proved by the new expositions of enthusiasts from around the world, the algorithms of which give truly incredible results: creating poems and lyrics, although very mediocre, before creating photographs of people who never existed.

This article is aimed at describing the scale of development of neural networks in the modern world.

Machine learning. Russian programmer Alexei Prikhodko, being deaf from birth, created a system that controls a computer using gestures and translates the language of people with hearing impairment into text.

The developed algorithm does not need sensors and additional devices - the machine works only with the help of computer vision. The camera recognizes the hand in the frame, creates its virtual model and displays the symbol on the screen. For example, seeing a fist, a neural network issues the letter "a". In addition to the translation, the neural network moves the cursor on the screen - without using a mouse, only tracking palm movements.

The most interesting and, at the same time, very dangerous, direction of the development of artificial intelligence is the "deep fakes". This is a human image synthesis technique used to connect and overlay existing images and videos on source images or videos [1]. Researchers downloaded neural networks from one photo and audio recording, and Einstein began to give a lecture, and Rasputin sang a song to Beyoncé [2].

This example shows that all one photo may not be enough for realistic facial expressions, but if you upload a network of a collection of photographs of a person, it turns out a strikingly natural picture even in motion [3].

Designer Konstantin Zhabinsky collected 100 thousand photos of non-existent people and posted them on Google Drive. In the database, there are people with different expressions and face shapes, of different ages and ethnicity [4]. Picture 1 shows examples of such "deep fakes."

Figure 1. – Photo of people generated by a neural network

The breadth of malicious use of "deep fakes" has become so great that researchers at the University of Southern California have created a tool that can recognize a non-existent person in the video with a 96% probability. The researcher's tool overlays the movie frames on top of each other and looks for any possible inconsistencies in facial expressions and head movements. It turns out that they usually exist - otherwise it would take too much time to create one "deep fakes".

Today, neural training is used in the development of software for environmental recognition, photo information and video information. Conventionally, this area is called computer vision. However, neural training

is not limited only to pictures, it can also be used to work with audio and fingerprint data (recognition of finger-prints, voices).

Google has demonstrated a neural network that can detect disease from a skin snapshot. Fifty thousand cases from the practice of dermatologists were loaded into the neural network and taught him to find twenty-six diseases. Recognition accuracy - up to 92%.

Artificial intelligence from the OpenAI company generates texts on any of the given topics, which in content can compete with any writer. To create such a tool, one and a half billion parameters and a large database were required. The developers trained the neural essence with the help of a popular social network, from where they collected texts with high reader ratings. As a result, the laboratory refused to lay out the code and showed only a small part of it [5].

Increasingly, they are resorting to the use of mobile devices to educate children in schools or children's rooms - this can reduce the time spent on maintenance, this is a cheaper and more durable solution, but, most importantly, it can reduce the influence of a person as a teacher. However, it becomes necessary to study the negative impact of computers on the body of children and the characteristics of attracting attention to the child.

Child features. Personal computers (PCs) are a source of electromagnetic radiation. Electromagnetic radiation generated by computers, under certain conditions, can be an increased danger to children, adolescents and adults. In order to reduce the impact of the PC on the user, it is recommended to limit the time spent working on the computer, mandatory pauses during operation, etc.

When organizing the workplace of a PC user, it must be borne in mind that the minimum distance from the screen to the operator is about 50-70 cm (arm length), and the nearest workstations from the side and back walls of the monitor - at least 1.5 m, a keyboard and hands. Operators should also be located as far away from the monitor as possible.

The room where the PC is installed must be equipped with protective grounding (grounding) and a bipolar outlet (with a grounded contact) connected to an electric mains with an industrial frequency of 220 V and a frequency of 50 Hz.

Priority and safest when using are liquid crystal monitors that are part of the PC.

According to experts of the Republican Center for Hygiene, Epidemiology and Public Health (ГУ РЦГЭиОЗ), the duration of continuous work on a computer for children of different ages should be as follows:
- 5 years - no more than 7 minutes;
- 6 years - 10 minutes;
- 7-9 years - 15 minutes;
- 10-12 years - 20 minutes;
- 13-14 years - 25 minutes;
- 15-16 years - 30 minutes.

In addition, between classes, if they involve a longer stay of the child in front of the screen, it is necessary to take breaks of at least 10 minutes [6].

Light and bright shades, cause positive emotions. It is proved that a good, high spirits can be created using also the color of ivory - light with a golden hue, light beige, and pale blue color [7].

Children are interested in bright colors. Many different studies were carried out, which showed that in childhood, a child changes its preference for colors many times. Most children under ten years old adore red, pink or yellow colors. As soon as the child is ten years old, he can already love the blue color with all its shades.

According to studies, girls prefer pink, lavender, purple flowers. Boys prefer dark and blue colors [8]. Figure 2 shows color schemes for children with graduation by gender.
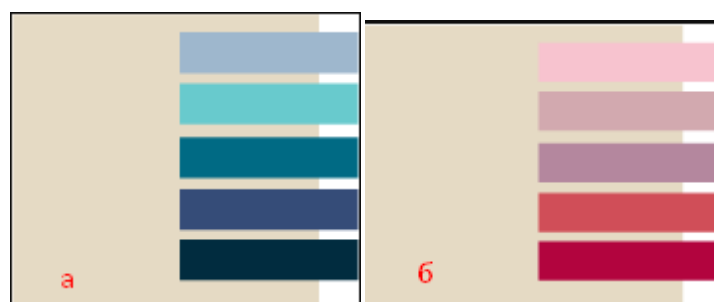

Figure 2. – Color preferred for children (a - boys, b - girls)

If the application is designed for children of any gender and age, the optimal solution for this is an interface that would satisfy all color requests. Figure 3 shows a color palette for children of any gender.

Figure 3. – Color preferred for children (a - boys, b - girls)

Conclusion. This article discusses the features of teaching children when working with computers, as well as some aspects of choosing a color scheme for the interior or graphical application interfaces.

This article discusses the main ways of development of neural networks in the modern world. The result of this article can be considered as the potential for the development of computer science.

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